



STATE OF TENNESSEE  
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**  
**State Revolving Fund Loan Program**  
L & C Tower, 8<sup>th</sup> Floor  
401 Church Street  
Nashville, TN 37243

**FINDING OF NO SIGNIFICANT IMPACT**  
**Approval of Facilities Plan**  
**Nashville (Davidson County), Tennessee**  
**Project No. SRF 2008-212**

**January 14, 2008**

The National Environmental Policy Act requires federally designated agencies to determine whether a proposed major agency action will significantly affect the environment. One such major action, defined by Section 511(c)(1) of the Clean Water Act, is the approval of a facilities plan prepared pursuant to Title VI of the Clean Water Act. In making this determination, the State Revolving Fund (SRF) Loan Program assumes that all facilities and actions recommended by the plan will be implemented. The state's analysis concludes that implementing the plan will not significantly affect the environment; accordingly, the SRF Loan Program is issuing this Finding of No Significant Impact (FNSI) for public review.

The City of Nashville has completed the facilities plan entitled "Barker Road/Omohundro Equalization Basin" dated August 17, 2007. The facilities plan provides recommendations for improvements to the wastewater treatment system serving Metropolitan Nashville/Davidson County. This project consists of the construction of a 10-million gallon circular concrete flow equalization basin in order to reduce rainfall-induced overflows at a manhole in a pasture that drains to tributary of the Cumberland River. The equalization basin will include a concrete dome cover and a modulating drain valve along with wash-down, metering, and control equipment. A new pump station will be constructed adjacent to the equalization basin. The new pump station will have three 30-million gallons per day submersible pumps to direct excessive flows to the equalization basin. The total estimated project cost is \$11,366,400.00. A State Revolving Fund loan in the amount of \$11,366,400.00 has been requested for this project.

Attached is an Environmental Assessment containing detailed information supporting this proposed action. Comments supporting or disagreeing with this proposed action received within 30 days of the date of this FNSI will be evaluated before we make a final decision to proceed. If you wish to comment or to challenge this FNSI, send your written comment(s) to:

Mr. Sam R. Gaddipati, Environmental Manager  
State Revolving Fund Loan Program  
Tennessee Department of Environment and Conservation  
L & C Tower, 8<sup>th</sup> Floor  
401 Church Street  
Nashville, TN 37243

or contact him by telephone at (615) 532-0445 or by e-mail at [sam.gaddipati@state.tn.us](mailto:sam.gaddipati@state.tn.us).

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**A. PROPOSED FACILITIES AND ACTIONS; FUNDING STATUS**

The City of Nashville has completed the facilities plan entitled “Barker Road/Omohundro Equalization Basin” dated August 17, 2007. The facilities plan provides recommendations for improvements to the wastewater treatment system serving Metropolitan Nashville/Davidson County. This project consists of the construction of a 10-million gallon circular concrete flow equalization basin in order to reduce rainfall-induced overflows at a manhole in a pasture that drains to tributary of the Cumberland River. The equalization basin will include a concrete dome cover and a modulating drain valve along with wash-down, metering, and control equipment. A new pump station will be constructed adjacent to the equalization basin. The new pump station will have three 30-million gallons per day submersible pumps to direct excessive flows to the equalization basin. The total estimated project cost is \$11,366,400.00. A State Revolving Fund loan in the amount of \$11,366,400.00 has been requested for this project. The facilities planning area and project location are indicated on Figures No. 1 and 2 of this Environmental Assessment. Descriptions of the proposed facilities and actions included in this project are listed below:

**FUNDING STATUS**

The facilities described above comprise the scope of Clean Water State Revolving Fund Loan No. 2008-212 scheduled for funding in fiscal year 2008. The estimated project costs are summarized in the following tabulation:

<u>PROJECT CLASSIFICATIONS</u>	<u>COSTS (\$)</u>
Administrative & Legal	50,000
Land Costs & Appraisals	1,000,000
Design Fees	191,000
Other Engineering Fees	75,000
Resident Inspection	156,000
Construction	8,000,000
Contingencies	1,894,400
<b>TOTAL</b>	<b>11,366,400</b>
State Revolving Fund Loan	11,366,400

**B. EXISTING ENVIRONMENT**

The Nashville Planning Area is located in Davidson County in the middle part of Tennessee. A discussion of existing environmental features in the area includes the following:

**SURFACE WATERS**

The main surface stream in the Nashville Planning Area is the Cumberland River, which drains the planning area directly and through tributary streams. These streams include Mansker Creek, Drakes Creek, White’s Creek, Dry Creek, Gibson Creek, and Little Marrowbone Creek drainage areas of the Cumberland River and Stones River. Mill Creek, Browns Creek, Richland Creek,

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Davidson Branch, and Overall Creek drain most of the Planning Area south of the Cumberland River. The Harpeth River drains the extreme southwestern portion of the planning area and the portion of the Harpeth River within Davidson County is protected under the provisions of the State of Tennessee's Scenic River Act. Water quality uses for the Cumberland River from River Mile (RM) 74.6 (KY-TN Line) to RM 118.3 (Cummings Creek) are industrial, fish, recreation, irrigation, livestock watering, wildlife, and navigation. Water quality uses for the Cumberland River from RM 118.3 to 125.3 (Red River) are industrial, fish, recreation, irrigation, livestock watering, wildlife, and navigation; and from RM 125.3 to 171.7 (Richland Creek) water quality use includes domestic, industrial, fish, recreation, irrigation, livestock watering, wildlife, and navigation. Metropolitan Nashville obtains its water supply from the Cumberland River upstream from the Central WWTP discharge.

Portions of three U.S. Army Corps of Engineers Reservoirs—Cheatham Reservoir, J. Percy Priest Lake, and Old Hickory Reservoir are located in the planning area. The three impoundments cover approximately 44,000 acres at normal pool.

#### GROUNDWATER

The Nashville Planning Area contains approximately 700 recorded wells with approximately 8 percent of the wells yielding water for commercial and light industrial uses. More than 50 percent of the wells obtain water from depths of less than 100 feet, and 20 percent obtain water from less than the 50 feet depth. Data on groundwater wells indicate most wells produce an average of 7 gallons per minute for a well depth between 50 and 100 feet. Approximately 80 percent of these wells provide water that contains no sulfur, iron, salt, oil, or gas.

#### SOILS

The soils in the planning area are of diverse geological and topographical formations. Soil characteristics within the designated planning area exhibit considerable variation from locale to locale. The soil associations in the planning area are predominately of nine varieties; the northwest portion of the Nashville Planning Area is comprised of the Mountview-Dickson Association. The Mountview soils are well drained but the Dickson soils have restricted internal drainage because of a hardpan layer in the subsoil. The soils are brown loamy soils formed in shallow loess overlying cherty clay from weathered cherty limestone.

The Bodine-Cannon Association located in a large area of north, west, and southwest Davidson County is formed from cherty limestone and is high in content of chert, are droughty and are naturally infertile. The high chert and rock content of the soils and the naturally-low fertility makes establishment of vegetation difficult.

The Talbott Soil Association is located in the south-central part of the planning area and is characterized by low, flat-top hills with moderately steep, short, side slopes and flat-bottom valleys. The soils of the hill tops and slopes are well drained, brown loamy soils and the soils in the valleys are well drained red clayey soils.

The Talbott-Rock Outcrop Association soils are well drained, red, clayey soils overlying massive jointed limestone at depths of about 40 inches. Talbott soils are low in natural fertility, have

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slow percolation rates and are subject to severe erosion. This soil group is located in the east-southeast part of the planning area.

The Arrington-Lynville Association soils are comprised of alluvial soils making up the flood plains of the Cumberland, Harpeth, and Stones Rivers. This soil group is well-drained to moderately well-drained loamy soils that are highly productive for agriculture.

The Maury-Armour Association soils generally make up the inter-media to terraces of the Cumberland and Harpeth Rivers. These soils are well-drained, red and brown, loamy soils, which are naturally fertile.

The Dellrase-Armour Association soils are on gently sloping terraces and footslopes and on moderate steep valley side slopes along the upper courses of larger secondary streams in the north and west portion of Davidson County. They consist of cherty and loamy material, and are well drained.

The Mimosa-Barfield Soils – Rock Outcrop Association soils are formed from material weathered from leveled bedded phosphatic limestone and are yellowish-brown, sticky, and plastic clay that is hard when dry and soft when wet. These soils located in the north, central and southeast part of Davidson County have very low percolation rates and are not suited for on-site sewerage disposal fields.

The Armour Arrington Association soils are located on nearly level flood plains of streams and the adjacent gently sloping terraces along the lower courses of secondary streams in the planning area. These are deep, well drained, and naturally fertile soils.

#### TOPOGRAPHY

The Nashville Planning Area occupies portions of the Central Basin (Nashville Basin) and the Highland Rim Physiographic Provinces. The planning area covers a land and water area of approximately 750 square miles. The portion of the planning area that lies within the Central Basin varies in elevation from approximately 400 feet above mean sea level (msl) at the flood plains of the Cumberland River to areas of rolling topography of approximately 600 feet above MSL. While most of the slopes of this area are within the 5-12 percent category, many reach 20 percent. Outstanding topographic landscape features of this area are sinkholes and knobs or small hills with elevations 200 to 300 feet greater than the surrounding land. Slopes of these hills are in excess of 20 percent.

#### OTHER ENVIRONMENTAL FEATURES

The Harpeth River located in the southwest part of Davidson County is classified as a scenic river from the Narrows of the Harpeth State Historic Area to the Davidson-Cheatam County line. Major impoundments in the Nashville Planning Area include J. Percy Priest Reservoir, Old Hickory Reservoir, and Cheatham Reservoir. Unique areas in the planning area include the Percy and Edwin Warner Park Nature Preserve, the Radnor Lake State Natural Area, and Marrowbone Lake. The Nashville Planning Area has many historic buildings, homes, and sites. Fort Negley located in the southeast part of Davidson County was a Federal Civil War facility

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and has been partially restored. Fort Negley and many other historic areas in the planning area are on the National Register of Historic Landmarks. Construction of the proposed facilities will not impact any of the scenic rivers or unique natural and historic areas in the planning area.

**C. EXISTING WASTEWATER FACILITIES**

The Central WWTP has a rated capacity of 125 MGD in dry weather and can treat up to 250 MGD through full secondary treatment plus an additional 80 MGD through a wet weather treatment unit consisting of primary settling plus disinfection. A portion of the influent to the Central WWTP is from the combined sewers which serve the downtown area. Unit processes include an influent pumping station, coarse grit removal, two sets of aerated grit chambers, 21 primary clarifiers, an intermediate pumping station, conventional activated sludge consisting of 8 aeration basins and 14 secondary clarifiers, disinfection consisting of three sets of chlorine contact chambers followed by a sulfur dioxide dechlorination system, and discharge to the Cumberland River through two diffused outfalls. The solids handling processes at the Central WWTP consist of thickening, liquid storage, and dewatering. Solids are removed from the primary clarifiers and flow by gravity to the belt filter press (BFP) feed well where they are comingled with scum pumped from the primary clarifiers. Waste activated sludge (WAS) is pumped from the final clarifiers to the gravity belt thickener (GBT) feed well where it is combined with WAS and primary solids from the Whites Creek WWTP. The Whites Creek WWTP solids are pumped to the Central WWTP at an approximately two percent solids content. The combined Central WWTP's WAS and Whites Creek WWTP's solids are thickened using eight GBTs. Polymer is added prior to thickening. The thickened solids from the GBTs are pumped to the BFP feed well where they are combined with primary sludge and scum from the primary clarifiers. The comingled primary solids, thickened WAS and scum are pumped to ten belt presses where a polymer is added prior to dewatering. The dewatered cake, at approximately 28 percent solids, is conveyed to an open air truck loading area where it is loaded into dump trailers and taken to a private landfill for final disposal. The loading and hauling operation is performed by a private contractor. The current disposal site for sludge from the Central WWTP is the BFI Middlepoint Landfill in Rutherford County. A project is under construction which will produce a "Class A" sludge at the Central WWTP which will not require landfilling. An odor control project is also under construction.

The Whites Creek WWTP has a rated capacity of 37.5 MGD and can treat up to 75 MGD during peak flows. Unit processes include aerated grit chambers, 12 primary clarifiers, conventional activated sludge consisting of 8 two-pass aeration basins and 10 secondary clarifiers, and disinfection through chlorination followed by discharge to the Cumberland River. All solids generated at Whites Creek WWTP are pumped to the Central WWTP for dewatering and disposal. WAS from the Whites Creek final clarifiers is pumped to two dissolved air flotation units where polymer is added prior to thickening. Scum and grease from the primary clarifiers is combined with thickened waste activated sludge (TWAS) in the TWAS well and is then pumped to two storage tanks. Primary solids from the primary clarifiers are also pumped to the storage tanks, where they are combined with the TWAS and scum. The mixture has a solids

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concentration of approximately 2 percent. The comingled solids are pumped via pipeline approximately 5.5 miles to the GBT feed well at Central for additional thickening. The solids are pumped continuously until the storage tanks are drawn down to desired levels.

Prior to 1997, solids were dewatered at Whites Creek using three belt filter presses. The BFPs, which are still at Whites Creek, have been cannibalized for repair parts for presses at Central and are no longer operational. Existing anaerobic digester tankage is being used to store the combined TWAS and primary solids. Of the four tanks in the digester complex, two are used for storage. The remaining two tanks have been abandoned in place.

The Dry Creek WWTP has a rated capacity of 24 MGD. Unit processes include an on-site pumping station, aerated grit chambers, two equalization basins totaling 14 million gallons, eight primary clarifiers, conventional activated sludge consisting of 6 two-pass aeration basins, nine secondary clarifiers, disinfection consisting of chlorination, a sulfur dioxide dechlorination system, and discharge to the Cumberland River. Dry Creek solids treatment includes thickening, liquid storage, and dewatering prior to landfill disposal. Primary solids and scum removed from the primary clarifiers are pumped to the primary sludge storage tank. WAS and scum from the final clarifiers are pumped to the WAS storage tank for thickening. Both storage tanks are modified anaerobic digesters and are equipped with coarse bubble aeration. The existing pipe and valve configuration allows solids transfer between the two tanks. WAS is pumped from the WAS storage tank to three GBTs. Polymer is added prior to thickening. The primary solids are pumped from the primary sludge storage tank to the TWAS well, where they are combined with the TWAS. The comingled solids are then pumped to four BFPs, where polymer is added prior to dewatering to approximately 28 percent solids. The dewatered cake is conveyed to an open-air load out area and loaded into dump trucks for landfill disposal. The loading and hauling operations are performed by a private contractor. The current and future disposal site for sludge from the Dry Creek WWTP is the BFI Middlepoint Landfill in Rutherford County. The odor identification and control study performed for the City in response to complaints from neighbors identified several treatment components from which odor leaves the WWTP. A project is currently under construction which will control odors and improve the solids handling process.

**D. NEED FOR PROPOSED FACILITIES AND ACTIONS**

Metro Water Services (MWS) is under a Tennessee Department of Conservation (TDEC) Commissioner's Order to eliminate Sanitary Sewer Overflow (SSO) in the MWS service area. MWS has identified 27 active overflow points and is in the process of planning, designing, or constructing projects to eliminate these overflow points. During wet weather, excessive infiltration and inflow causes sewage overflows at a manhole in a pasture that drains to tributary of the Cumberland River. This project is a continuation of overflow abatement improvements in the Barker Road/Visco Drive sewer drainage basin area. Numerous sewer lining and manhole rehabilitation projects have been completed in this basin. It has been determined that flow equalization will be more cost effective for this basin than additional sewer lining and manhole rehabilitation projects at this time.

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Existing and projected facility conditions are shown in the following chart:

<u>POPULATION</u>	<u>EXISTING (2008)</u>	<u>PROJECTED (2028)</u>
Metropolitan Nashville Planning Area	669,300	781,349
% Sewered	95%	95%

  

<u>White's Creek Flows</u>	<u>EXISTING (2008)</u> <u>(MGD)</u>	<u>PROJECTED (2028)</u> <u>(MGD)</u>
Domestic/Commercial, Industrial, and Infiltration	30.6	35.6
Inflow (during rainfall events)	41.7	39.4
<b>TOTAL</b>	<b>72.3</b>	<b>75.0</b>

  

<u>Central Flows</u>	<u>EXISTING (2008)</u> <u>(MGD)</u>	<u>PROJECTED (2028)</u> <u>(MGD)</u>
Domestic/Commercial, Industrial, and Infiltration	91.9	114.4
Inflow (during rainfall events)	197.1*	176.0*
<b>TOTAL</b>	<b>289.0</b>	<b>290.4</b>

  

<u>Dry Creek Flows</u>	<u>EXISTING (2008)</u> <u>(MGD)</u>	<u>PROJECTED (2028)</u> <u>(MGD)</u>
Domestic/Commercial, Industrial, and Infiltration	17.6	20.1
Inflow (during rainfall events)	32.7	43.0
<b>TOTAL</b>	<b>50.3</b>	<b>63.1</b>

\*Contains the combined sewer contribution

Effluent limitations for the three WWTPs are as follows (monthly average milligrams per liter unless otherwise noted):

<u>EFFLUENT PARAMETER</u>	<u>Whites Creek WWTP</u>	<u>Central WWTP</u>	<u>Dry Creek WWTP</u>
CBOD5 (May 1- Oct. 31)	10	10	25
COD5 (Nov. 1- Apr. 30)	15	20	25
Ammonia as N (May 1- Oct. 31)	5	5	10
Ammonia as N (Nov. 1- Apr. 30)	10	10	10
Suspended Solids	30	30	30
Fecal Coliform	200/100 milliliter (ml)	200/100 ml	200/100 ml
Chlorine Residual	0.9 instantaneous	0.26 instantaneous	1.04 instantaneuos

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<b><u>EFFLUENT</u></b>	<b><u>Whites Creek WWTP</u></b>	<b><u>Central WWTP</u></b>	<b><u>Drv Creek WWTP</u></b>
<b><u>PARAMETER</u></b>			
Settleable Solids	1.0 milliliter/liter (ml/l)	1.0 ml/l	1.0 ml/l
Dissolved Oxygen	5.0 instantaneous	5.0 instantaneous	5.0 instantaneous
pH (standard units)	6.0-9.0	6.5-9.0	6.0-9.0
Total Nitrogen	N/A	N/A	Report Data Only
Total Phosphorous	N/A	N/A	Report Data Only
Mercury	0.00020	N/A	N/A

All three WWTPs are currently meeting their respective NPDES limits.

**E. ALTERNATIVES ANALYSIS**

Several alternatives, including a “No-action” alternative, were evaluated for wastewater collection in the August 17, 2007, facilities plan. A summary discussion of the evaluation of each alternative for wastewater collection and the selection of the recommended plan follows:

**NO ACTION**

If no action is taken, MWS will continue to experience excessive flows resulting in overflow of sewage to the environment and violation of the Commissioner’s Order. Therefore, some action must be taken to protect the environment and public health and to comply with the Commissioner’s Order, and this alternative was rejected.

**ALTERNATIVES**

**Replace Defective Line Segments**

This alternative would involve open cut excavation to remove and replace the existing defective sewer line segments. This alternative was not the most cost-effective and was rejected.

**Cured In Place Pipe (CIPP) Technology**

This technology creates a new pipe within the existing defective pipe. MWS has already completed 6 CIPP projects in this sewage basin. These CIPP projects are proving to be less cost effective since the most obvious areas in need have been repaired. It has been determined that additional CIPP projects will not be the most cost-effective alternative, and, therefore, this alternative is rejected.

**Flow Equalization**

This alternative involves retaining excessive flow in an equalization basin until such time that the sewer lines are no longer surcharged. The sewage in the equalization basin is then slowly released back into the collection system. Flow equalization is the most cost-effective alternative and is, therefore, the selected alternative.

**SLUDGE TREATMENT/DISPOSAL**

The proposed project will have no foreseeable impact on sludge treatment or disposal. Sludge disposal was previously discussed in Section C.

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**F. ENVIRONMENTAL CONSEQUENCES; MITIGATIVE MEASURES**

The environmental benefits of this project will be a reduction in sewage overflows and the improvement of water quality conditions in the area.

During the construction phase, short-term environmental impacts due to noise, dust, mud, disruption of traffic, runoff of silt with rainfall, etc., are unavoidable. Minimization of these impacts will be required; however, many of these minimization measures will be temporary and only necessary during construction. Using the following measures to prevent erosion will minimize impacts on the environment:

1. Specifications will include temporary and permanent measures to be used for controlling erosion and sediment.
2. Soil or landscaping maintenance procedures will be included in the specifications.
3. The contractor will develop an Erosion Control Plan. It will contain a construction schedule for each temporary and permanent measure controlling erosion and sediment. It will include the location, type, and purpose for each measure and the times when temporary measures will be removed or replaced.

These measures, along with requiring the contractor to return the construction site to as-good-as or better-than its original condition, will prevent any adverse impacts due to erosion.

No prime or unique agricultural lands or wetlands were identified and therefore will not be adversely affected. No endangered species of flora or fauna were identified within the proposed construction corridor. Effects on flora and fauna will be confined and temporary.

No endangered species of flora or fauna were identified within the proposed construction corridor. Effects on flora and fauna will be confined and temporary.

**G. PUBLIC PARTICIPATION; SOURCES CONSULTED**

A Public Meeting was held on August 28, 2007, at 6:30 p.m., local time. The selected plan for wastewater treatment plan and user charges were described to the public, and their input was received. This agency is not aware of any unresolved public objections that may have been voiced before or after the public meeting regarding this project.

The existing user charges are sufficient to repay the SRF loan. Therefore, no incremental increase in user charges will be required.

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Sources consulted about this project for information or concurrence were:

1. Tennessee Department of Agriculture
2. Tennessee Department of Economic and Community Development (ECD)
3. Tennessee Department of Environment and Conservation (TDEC), Division of Air Pollution Control (DAPC)
4. Tennessee Department of Transportation (TDOT)
5. TDEC, Division of Groundwater Protection (DGWP)
6. Tennessee Historical Commission
7. TDEC, Division of Archaeology (DA)
8. TDEC, Division of Natural Areas (DNA)
9. TDEC, Division of Solid Waste Management (DSWM)
10. TDEC, Division of Water Pollution Control (DWPC)
11. TDEC, Division of Water Supply (DWS)
12. Tennessee Wildlife Resources Agency (TWRA)
13. United States Army Corps of Engineers (USACE)
14. United States Fish and Wildlife Service (USF&W)
15. Metropolitan Nashville/ Davidson County

**H. SPECIAL CONDITIONS**

The State Revolving Fund loan agreement will have the following special condition:

An archaeological assessment must be conducted for the potential presence of intact cultural resources (including human burials) in the proposed project area. Copies of the assessment and findings must be submitted to the Tennessee Historical Commission, the Division of Archaeology, and the State Revolving Fund Loan Program. Any findings that must be preserved shall be removed/protected/preserved in accordance with state and federal laws, regulations, and/or policies.